this as being, perhaps, a slight tendency to remissions, and fearing that, as the day advanced, the fever would be exasperated, I swallowed, at 5½ A. M., after considerable hesitation, 15 grains of quinine in solution, with ℥ij. inf. of capsicum. This, in about half an hour, produced a slight perspiration on the forehead, and sensibly relieved the pain of the head. At 7 A. M. I took a bowl of hot coffee, which brought out a free and general perspiration. At 8 A. M., 5 grs. of quinine in solution, with ℥j. inf. of capsicum, were taken and nothing more during the day. The skin continued free; the headache abated entirely; the pulse became slow and soft; and the day was passed comfortably in every respect;—so much so that I was enabled to take the foregoing notes of the case during the afternoon.

"*Tuttoo.* Still feel well; some appetite. No medicine.

"*7th.* Perfectly well with the exception of some debility. Appetite improving. Took 5 grs. of quinine with capsicum three times to-day to prevent relapse.

"*Remarks.*—Had other remedies been given, or any other plan of treatment been adopted; had I placed my reliance on diaphoretics, alteratives, or even upon small doses of quinine on the morning of the 6th; a sick day, and a confirmed remittent fever, would have undoubtedly followed. The combination of quinine and capsicum in a decided dose produced such an immediate impression upon the nervous system, through the stomach, as to equalize the circulation, and cut short the disease."

Shortly after the attack of sickness described above, Dr. Porter was relieved from duty at Fort King, very much broken down in health, as indeed were all who had remained at that station during the summer, and was ordered to the U. S. Barracks at St. Augustine, where he encountered the yellow fever which prevailed to a fatal extent amongst the troops at that post in the months of October and November of the same year.

Dr. Porter describes the congestive fever, of which disease he met with numerous cases in the course of his Florida service, at considerable length. It was in this disease that the powers of the large doses of quinine were exhibited in the most striking manner. This department of the subject, together with the effects of quinine in yellow fever will, however, be necessarily deferred for the present.

Surgeon-General's Office, *Washington, D. C.*, June, 1845.

Art. V.—*Practical Observations on the Radical Treatment of Varicocele.*

By John Watson, M. D., Surgeon to the New York Hospital.

In the few remarks which I have to offer on the radical treatment of varicocele, I shall confine myself, for the most part, to the operation first suggested by the late Sir Astley Cooper. I have already alluded to this

subject in a previous publication.* But, as the procedure to which I refer, cannot, as yet, be said to have been generally adopted by the profession, or even to have received that amount of consideration which it appears to deserve, I deem no apology necessary for alluding to it again.

It is perhaps proper to premise, that, in the great majority of cases, varicocele gives rise to so little inconvenience, that any attempt at a radical cure by a dangerous or severe operation, is entirely out of the question. Operative measures are scarcely ever called for in persons who are not obliged to lead an active life. Even amongst labouring men the number of cases justifying surgical interference, is by no means so great as the repeated operations of some surgeons would lead us to infer. In short, those who, within a few years past, have furnished accounts of their operations on scores and hundreds of cases of varicocele, have either entirely mistaken the true end of operative surgery, or have been placed under circumstances precluding their experience from all contrast or comparison with that of other surgeons.

Still, cases do occur in which we are called upon to attempt the radical cure of this disease. In all such the operation of Sir Astley Cooper, if I may speak from my own observation of its effects, should be employed to the exclusion of every other method hitherto proposed. When properly performed it is sufficiently efficacious; it subjects the patient to none of the serious consequences that too often attend every mode of operating that is addressed directly to the spermatic veins; it is less objectionable than the operation for ligaturing the spermatic artery; it gives rise to less suffering, and is more efficacious than Breschet's mode of indirect compression; it does not interfere with the functions of the testicle, which are necessarily destroyed by every other mode of operating;—and, if performed sufficiently early, before the disease has led to atrophy of the testicle, it may be the means of actually preserving the functions of this organ.

It consists essentially in diminishing the size of the scrotum by the removal of a portion of integument; and in forcing the tissues to consolidate over the spermatic cord: thus, permanently elevating and supporting the testicle, and at the same time, compressing the varicose mass in such a way as effectually to diminish, if not actually to obliterate it.

Sir Astley Cooper's first idea, in suggesting the operation, appears to have been simply to modify the shape and size of the scrotum so as to enable the patient to dispense with the use of a suspensory bandage. The operation has effected more than this. Yet this imperfect object has led both Sir Astley and some of those who have followed him, to remove a smaller extent of integument than is in most cases requisite to effect a permanent cure, and to arrange the line of cicatrization in a course by no

* N. Y. Journal of Med. and Surg., Oct. 1840. See also Curling on the Testis, p. 484; and this Journal for August, 1838, p. 492.

means the best adapted for exercising permanent pressure along the course of the varicose vessels.

His mode of performing the operation, as given in his own words, is as follows:—"The patient being placed in the recumbent posture, the relaxed scrotum is drawn between the fingers, the testis is to be raised to the external ring by an assistant, and then the portion of the scrotum is removed by the knife or knife-scissors; but I prefer the former. Any artery of the scrotum which bleeds is to be tied, and a suture is then to be made to bring the edges of the diminished scrotum together. The patient should be kept for a few hours in the recumbent posture, to prevent any tendency to bleeding, and then a suspensory bag is to be applied, to press the testis upwards and to glue the scrotum to the surface.

"The only difficulty, in the operation of removing the scrotum by excision, is in ascertaining the proper quantity to be removed; but it adds but little to the pain if a second portion be taken away, if the first does not make sufficient pressure on the spermatic cord. It is of no use to remove a small portion of the scrotum, for from doing this I have failed. When the wound has healed, the varicocele is lessened, but not always entirely removed; but the pain and distressing sensations cease if sufficient of the scrotum be removed.

"In making the suture in the scrotum, its lower part is to be brought up towards the abdominal ring, to raise and support the testis, as does the suspensory sling when it is worn."*

The mode of operation which I have employed is in some respects different from the foregoing. The course of the incision, instead of being transverse at the bottom of the scrotum, is made in an oblique direction with its upper angle over the situation of the external abdominal ring on the affected side, and its lower angle somewhat beyond the *raphé* near the bottom of the scrotum on the opposite side. The testis is not to be forced upwards against the abdominal ring, but to be drawn sidewise. The portion of integument to be removed, before commencing the incision, is to be drawn out between the blades of a long and slender pair of curved forceps, the convexity of which should face the line of incision. The whole mass thus secured is to be removed by a single sweep of the bistoury. The incision thus made removes only the integument. The diseased cord with its envelopes, and both testicles with their serous investments, are at once exposed. The retraction of the remaining portion of the scrotum is so great that, at first, the patient appears to have none of it remaining.

The incision usually involves the external pudic artery, and sometimes a few smaller vessels, which require to be secured. The edges of the wound are to be drawn together—not transversely as recommended by Cooper—but in such a way as to allow the line of suture to follow the

* Guy's Hospital Reports, vol. 3, p. 9; also this Journal for Aug., 1838, p. 493.

natural course of the cord, and so round below the testicle towards the opposite side. This mode of procedure requires a greater number of stitches than Cooper advises. And in order to cover the testicles and to bring the edges of the wound into exact coaptation, there is at first considerable stretching of integuments necessary. But the integuments in every direction around the scrotum are so yielding, that there is no difficulty in obtaining sufficient covering for the testicles, even after removing nearly the whole scrotum. This fact I have seen verified in repeated instances of sloughing of the scrotum from infiltration of urine, as well as from the erosive action of the fluids used for injecting the cavity of the tunica vaginalis in the treatment of hydrocele. Finally, after the edges of the wound have been brought into coaptation, instead of applying a suspensory band, I have the parts well supported with strips of adhesive plaster.

In one instance in which this mode of proceeding was followed by one of my colleagues, after drawing out the integuments between the blades of the forceps I advised him to insert a few suture-threads below the forceps, so as to prevent the retraction of integuments after the incision. But this procedure was not found to expedite the operation. It was afterwards necessary to remove these stitches in order to secure the vessels that had been divided.

Mr. Key,* in following Sir A. Cooper, lays much stress on the importance of effecting union by the adhesive process, in order to secure the most favourable results of the operation. Speaking of a case of his own, in which he failed to effect this, he remarks: "The support which the veins would have received, if the wound had healed by adhesion, would have been more effectual; and I should in another case take every precaution to ensure the adhesive process."

Now, of the five instances of this operation that have fallen under my own observation, complete union by the first intention was not effected in a single one; and I am not aware that the result of the operation was any the less advantageous on that account. Indeed, the parts are more effectually consolidated by the process of granulation and cicatrization than by that of adhesion. The final union is quite as firm. The only disadvantage of the adhesive process is in the question of time. A certain amount of fibrinous deposit, in the cellular tissue, both external to the sheath of the spermatic cord and within it, appears to be necessary for effectually obliterating the varicose swelling. And this is surely more apt to be effected where the wound becomes inflamed and subsequently heals by granulation and cicatrization, than where it heals at once by adhesion.

The following case, the last upon which I have operated, and perhaps the most successful of any that I have met with, will show sufficiently well that union by adhesion is far from being essential to the success of the operation.

* Guy's Hospital Reports, vol. 3, p. 12.

John Nichols, a German seaman, aged 22, was admitted into the New York Hospital, Feb. 7th, 1845, with slight stricture of the urethra, and with a varicose swelling on the left spermatic cord of several years' duration. The varicocele had been a source of much annoyance to him. The testicle was somewhat soft, and the swelling above and behind it, of an irregular shape and as large at least as a hen's egg, was composed of a vast congeries of vessels that were disposed to become still more distended by sudden exertion, as in lifting, and straining, or in pursuing his usual employment. The swelling was at times attended with pain in the loins and a dragging sensation along the cord; and it interfered so much with his occupation as to render him anxious to submit to an operation for relief.

On the 20th of February the whole of the free integument of the scrotum that could be embraced, without much stretching, between the blades of a very long and slender pair of forceps, made to pass from over the affected cord, obliquely downwards to the lower part of the scrotum on the opposite side,—was drawn outwards, and with one sweep of the bistoury effectually removed. The edges of the wound thus made, gaped so much as completely to expose both testicles, covered only by the tunica vaginalis. The external pudic artery, near the upper angle of the wound, had been divided; and it was the only vessel that required a ligature. Five or six interrupted sutures were necessary for bringing the edges of the wound into neat coaptation along the course of the cord, and so on below the testes. These sutures were further supported by strips of adhesive plaster.

The patient had little or no suffering from the wound. For several days he was confined to bed, and the parts were kept covered with water dressings. In consequence of the tension of the integuments, several of the stitches ulcerated, and in a few days after the operation, the wound began to gape considerably in its middle. The parts were subsequently approximated with adhesive strips, and cicatrization progressed favourably. Before the end of a month the wound had healed, and the varicocele had entirely disappeared. The patient remained in the hospital, under treatment for his stricture, up to the 6th of May, walking about most of the time, and occasionally exerting himself without the least disposition to a recurrence of the varicocele.

The only unpleasant accident that I have known to follow this mode of treatment, is one not more essentially connected with this than with any other operation, viz., the supervention of erysipelas. This occurred in my first case, already published; and although it prevented union by the first intention, I am not aware that it in any way prevented the patient from finally experiencing all the advantages that were to be expected from the operation.

Complications.—The mode of treatment above described is probably applicable to every case in which operative measures are at all advisable. But there is occasionally much judgment necessary to determine whether severe cases of what might be mistaken for simple varicocele, should or

should not be subjected to operation. Those who have written expressly on this disease, have hitherto said little or nothing of its complications. And the surgeon, unaware of these, may, from incautious interference by any mode of operating, do actually more harm than good. This remark is worthy of special consideration. Its truth and importance, I think, are sufficiently shown by the two following cases.

Case I.—*Irritable testis following parotitis, and complicated with varicocele, treated by excision of part of the scrotum, without benefit.*—M. J., a robust middle-aged man, a pilot, applied to me for advice on the 24th of March, 1843, stating that he had, some months before, submitted to an operation for the cure of what was considered a varicocele, with more injury than benefit.

About twelve years before I saw him, he had had an attack of mumps, which, in subsiding, affected his left testicle by metastasis. An irritable state of this organ, which was thus induced, has continued to trouble him ever since. In July, 1842, he consulted a surgeon of some repute, who finding the left spermatic veins somewhat varicose, advised the patient to submit to the operation which I have above described. About half the integument of the scrotum was removed by a single incision. The wound was kept from gaping by the insertion of needles and ligatures, prior to the removal of the integument. The operation was soon followed by infiltration of the cellular tissue with a vast amount of blood. For the removal of this, it was found necessary to undo the dressings and open the wound anew. In due time the incision healed; but without any good effects upon the neuralgic condition of the testicle. From the date of the operation, until I saw him, he had never been free from pain. This he compared to the toothache. It ascends from the testis, in the course of the cord, up to his loins. Prior to the operation he had suffered only from the left testicle; but, since the cicatrization of the wound, he has also had occasional and severe pain in the right organ. On examination I did not find the veins of either cord varicose; but in the upper and anterior part of the epididymus of the left testis, there was a small indurated spot from which all his pain appeared to diverge. He could not bear the weight of the finger on the spot. He had at different times been under various kinds of treatment, without relief. His sufferings had obliged him to relinquish his occupation. I gave him no encouragement in the way of cure by any means short of extirpation of the testicle. But for this he was not prepared.

Case II.—I was invited, September 9th, 1840, to assist in an operation for the cure of varicocele on a medical gentleman, about thirty-six years of age, of highly nervous and irritable temperament. The operation was performed as above described; stitches being introduced prior to the removal of the integument. The wound soon healed; but the patient's sufferings were in no respect alleviated. On further inquiry I ascertained from him, that for several years he had suffered severe darting pains in the left testicle; with a dragging sensation in the loins, and along the left spermatic cord; the veins of which were somewhat varicose. The neuralgic pains, at first confined to the left testicle, at length extended to the right. But on this side they were only occasionally felt, and never so severely as at their primitive seat. He had also had some symptoms of gravel, and had several times voided small calculi. He continued to suffer very severely

for years subsequent to the operation; he finally lost his life by taking a large dose of strychnine in mistake for a dose of morphine.

Mr. Curling,* in speaking of the pain of varicocele, observes, that in some cases it is dull and heavy, and that in others it assumes a neuralgic character so excessive and intolerable that patients have gladly submitted to castration for relief. He cites instances in which castration has been performed with this view, by Gooch, Sir B. Brodie, Mr. Key, and others.

Without stopping to inquire whether the varicocele, in these instances, was the primary affection, or the mere result of a pre-existing neuralgia, I am sufficiently convinced, that, in the two cases above stated, the varicose condition of the spermatic veins was a matter of secondary moment; occurring as a consecutive affection, in the progress of a more serious disorder, in the same way that we see the veins in other parts of the body to which there has been, for any length of time, an undue afflux of blood, become dilated, tortuous and nodulated, and sometimes remain so after the primary affection has subsided. Thus, I have known the veins of the leg to become varicose after a severe injury, near the knee joint, and remain permanently dilated for some distance around the seat of injury for years after the parts had in other respects assumed their healthy condition. I have seen the integuments of the abdomen, traversed in all directions, with superficial varices, the result of an osteo-sarcoma growing from within the pelvis and pressing upwards against the abdominal parietes. The same condition of these vessels is every day observed in the neighbourhood of carcinomatous growths, and around large tumours of every sort, whether benign or malignant.

The practical result of the whole matter, then, is, that if varicocele is found to be complicated with excessive neuralgia, the surgeon, before proceeding to any mode of operating, should be well convinced that the varicose condition of the spermatic cord preceded the occurrence of the neuralgic symptoms, and that these latter are attributable to no other complicating affection.

Neuralgia, however, is not the only complication I have met with. In two cases which I have recently had under treatment, I have found extensive varicocele complicated with serous effusions, partly into the cavity of the tunica vaginalis, and partly sacculated above this along the course of the spermatic cord. In both of these instances the testicle was, at the same time, much engorged, and at least twice as large as natural. The attempt to operate for the radical cure of varicocele in such cases, is, of course, entirely out of the question; at least until after the cure of the hydrocele and engorgement of the testicle. In these two instances the complicating affections were evidently consecutive to the disease of the spermatic veins.

New York, *August* 8th, 1845.

* On the Testis.